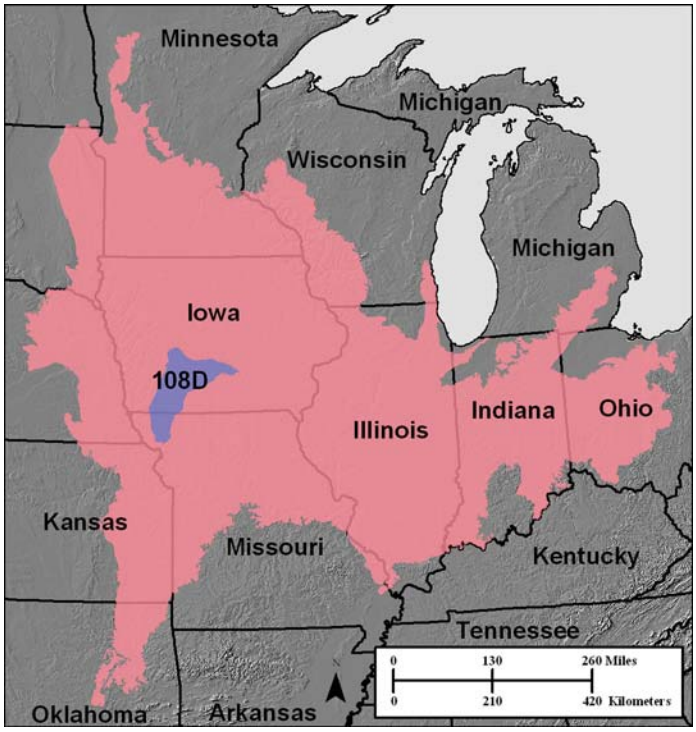

Location of MLRA 108D in Land Resource Region M.

108D—Illinois and Iowa Deep Loess and Drift, Western Part

This area is in Iowa (82 percent) and Missouri (18 percent). It makes up about 5,480 square miles (14,195 square kilometers). It includes the towns of Clarinda, Creston, and Indianola, Iowa; the southern part of the city of Des Moines, Iowa; and the town of Maryville, Missouri. Interstate 35 crosses the eastern part of the area from north to south, and Interstate 80 crosses the northern end of the area.

Physiography
This area is in the Dissected Till Plains Section of the Central Lowland Province of the Interior Plains. The area is in a landform region locally called the Southern Iowa Drift Plain. Slopes are mostly rolling to hilly, but some broad ridgetops are nearly level to undulating and areas bordering the major stream valleys are steep. Nearly level, broad valley floors are along a few large rivers. Elevation ranges from 690 feet (210 meters) in the lowest valleys to 1,510 feet (460 meters) on the highest ridges. Local relief is mainly 10 to 20 feet (3 to 6 meters), but valley floors can be 80 to 200 feet (25 to 60 meters) below the adjacent uplands. Also, some upland flats and valley floors have local relief of only 3 to 6 feet (1 to 2 meters).

The extent of the major Hydrologic Unit Areas (identified by four-digit numbers) that make up this MLRA is as follows: Missouri-Nishnabotna (1024), 54 percent; Des Moines (0710), 37 percent; and Chariton-Grand (1028), 9 percent. The Raccoon and Des Moines Rivers empty into the Mississippi River to the southeast of this area, and the Platte and Nodaway Rivers empty into the Missouri River to the southwest of the area. The Tarkio-Wolf, West Nodaway, Nodaway, One-Hundred and Two, and Platte watersheds and parts of the Lake Red Rock and Thompson watersheds have more than 6,700 miles of streams and associated wetlands in this area.

Geology
This MLRA is underlain by dense pre-Illinoian till, which was deposited more than 500,000 years ago and has since undergone extensive erosion and dissection. A mantle of silt (Peoria Loess) covers the till surface on the hillslopes, and Holocene alluvium (DeForest Formation) is typically in stream valleys. The till is generally less than 150 feet (45 meters) thick in the northern and southwestern parts of the area and ranges from 150 to 350 feet (45 to 105 meters) in thickness in the rest of the area. It is underlain mainly by Pennsylvanian bedrock consisting dominantly of shale and mudstones.

Climate
The average annual precipitation in this area is 33 to 37 inches (840 to 940 millimeters). Most of the rainfall occurs as convective thunderstorms during the growing season. About 10 inches (25 centimeters) of the precipitation occurs as snow in the winter. The average annual temperature is 48 to 52 degrees F (9 to 11 degrees C). The freeze-free period averages about 185 days and ranges from 175 to 200 days.

Water
Following are the estimated withdrawals of freshwater by use in this MLRA:
Public supply—surface water, 13.1%; ground water, 15.6%
Livestock—surface water, 2.4%; ground water, 10.3%
Irrigation—surface water, 0.1%; ground water, 0.0%
Other—surface water, 53.0%; ground water, 5.5%

The total withdrawals average 71 million gallons per day (270 million liters per day). About 31 percent is from ground water sources, and 69 percent is from surface water sources. In most years lack of moisture

is not a problem for agricultural production. Large rivers provide surface water for livestock, industry, and public supplies in the area. Some water for livestock is stored in small ponds and reservoirs. The surface water is of fair quality and is suitable for most uses with treatment. Contamination from sediment, nutrients, and pesticides from agricultural activities and wastewater discharges from cities cause some water-quality problems.

The principal sources of ground water in the area are glacial drift aquifers, buried channel aquifers, and alluvial aquifers. Glacial drift aquifers supply many rural homeowners with small quantities of domestic water and some livestock water. Alluvial deposits provide much greater quantities of water for domestic use, livestock, and some public supply. Buried channels typically consist of glacial outwash deposits that filled preglacial valleys and then were covered by glacial drift. Large quantities of water can be obtained from this aquifer in the limited areas where the aquifer occurs. This aquifer can provide water for domestic use, livestock, and some public and municipal supply. All of these surficial aquifers have good-quality water. The water is very hard, but the median level of total dissolved solids is very near the national secondary drinking water standard of 500 parts per million (milligrams per liter).

Paleozoic bedrock aquifers are not utilized very much in this area. The Dakota aquifer underlies the northwestern part of the area, and the Jordan aquifer underlies all of the area. The Jordan aquifer is the most extensively used aquifer in Iowa. It consists of sandstone and dolomite of Ordovician and Cambrian age. Well yields from this aquifer are very high, and the water is suitable for most uses. The median level of total dissolved solids, however, typically exceeds 800 parts per million (milligrams per liter), and radium-226 levels can exceed the national standard for drinking water. The Dakota aquifer consists of Cretaceous-age sandstone. It is close to the surface in this area, and its water is very similar in quality to the water in the Jordan aquifer. Some communities and rural homeowners utilize these bedrock aquifers for drinking water where no other aquifers are available. The water from the Jordan and Dakota aquifers is used for domestic purposes, livestock, and some public and municipal supply and industry.

Soils

The dominant soil orders in this MLRA are Mollisols and Alfisols and, to a lesser extent, Entisols. Most of the soils are Udolls or Udalfs. Aquolls are on the flatter interfluves. The soils in the area dominantly have a mesic soil temperature regime, an aquic or udic soil moisture regime, and mixed mineralogy. They generally are very deep, well drained to poorly drained, and silty, loamy, or clayey. The soils on uplands include somewhat poorly drained, nearly level Argiudolls (Macksburg series); moderately well drained, gently sloping to strongly sloping Argiudolls (Sharpsburg and Exira series); poorly drained, nearly level Argiaquolls (Winterset and Taintor series); and well drained, strongly sloping to steep Hapludalfs (Gara, Lindley, Ladoga, Armstrong, Keswick, and Clinton series). Somewhat poorly drained Hapludolls (Lawson series) and moderately well drained Udifluvents (Nodaway series) formed in silty alluvium on flood plains. Poorly drained Endoaquolls (Colo and Zook series) formed in clayey alluvium on flood plains.

Biological Resources

Prairies in this area support tall grasses on moist soils and xeric short grasses on uplands. In the prairies, grama, muhly, lovegrass, and bentgrasses commonly grow beside the more familiar grasses, such as little bluestem, big bluestem, Indiangrass, and wildrye. The forbs growing in the area include Mead's milkweed, fragrant false indigo, showy lady's slipper, western prairie fringed orchid, Virginia spiderwort, scaly blazing star, Baldwin ironweed, and slender mountain mint.

Forests on uplands commonly support red oak, white oak, bur oak, chinkapin oak, black oak, hackberry, shagbark hickory, and bitternut hickory and may support some pawpaw. Forests on bottom land support mulberry, sycamore, cottonwood, willow, elm, white ash, silver maple, buttonbush, and American elder.

The plains leopard frog, Henslow's sparrow, northern harrier, smooth green snake, spotted skunk, and massasauga rattlesnake inhabit the prairies in this area. Brown snake, smallmouth salamander, western worm snake, speckled king snake, and the Indiana bat inhabit the forested areas. The area has 29 threatened or endangered species or species of special concern. The watersheds are inhabited by many rare and declining species, such as the Blanding's turtle, Topeka shiner, small white lady's slipper, showy lady's slipper, and glomerate sedge.

Land Use

Following are the various kinds of land use in this MLRA:

Cropland—private, 66%
Grassland—private, 20%
Forest—private, 6%
Urban development—private, 4%
Water—private, 2%
Other—private, 2%

Historically, 86.75 percent of this area was prairie. Forest made up 9 percent of the area; savannas, 4 percent; shrub lands,
0.2 percent; wetlands, 0.04 percent; and ponds and lakes, 0.01 percent.

Currently, about 86 percent of this area is agricultural land. Cash-grain crops dominate the area, although hay and pasture crops also are grown in support of local livestock production.

The major resource concerns are water erosion, depletion of the organic matter in the soils, and poor water quality. Conservation practices on cropland generally include systems of crop residue management (especially no-till, strip-till, and mulch-till systems), cover crops, nutrient and pest management, grassed waterways, terraces, manure management, pasture and hayland planting, and grade-stabilization structures.